coil **44** by way of mutual induction, a computer **43** may control the signal fed to the coil **36**, while monitoring the voltage/current in conductors **34** which are electrically connected to electrodes **22**, **24**. It should be noted that the current in conductors **34** will never be a DC current as the current will be due to either the pulsing of coil **36**, random motion of the diaphragm **14**, or motion associated with a much larger piece of synthetic muscle (not shown) which may be connected to leads **45**, as will be explained in more detail later. In the event the pump **10** is powered solely by way of a larger piece of artificial muscle, coil **44** may be used solely for sensing the current pulses received by electrodes **22**, **24**. In this case, the computer **43** may be used to monitor the frequency and magnitude of the current in coil **36**. A display means **49** such as a CRT may be used to display the sensed current. The display **49** may show all sensed operational parameters associated with pump **10**. The display **49** may also show a control panel which may be accessed by a mouse (not shown) allowing the operator to selectively control various operational parameters such as the frequency and magnitude of voltage source **47**, the display format, or resolution for displaying the sensed parameters. Alternatively, the computer **43** may be set up to selectively gate pulses to electrodes **22**, **24** regardless of the type of voltage source. For example, if the current provided by a large piece of artificial muscle connected to leads **45** is too high in frequency producing rapid undulations in diaphragm **14**, the computer **43** may block every other pulse to reduce the frequency by a factor of 50%. As would be apparent to one of skill in the art, the computer **43** may be a microprocessor small enough for attachment to a human body via, e.g., surgical tape, with sensing/pulsing coil **44** mounted internally to the microprocessor **43** or immediately adjacent thereto in order to send/receive voltage signals to/from coil **36**.

[**0042**] In lieu of having an induction coil **36** coupled to an external electromagnetic field or voltage source, a synthetic muscle (not shown) may be used to generate operating voltage for the pump assembly **10**. The synthetic muscle, which would be relatively large compared to the diaphragm **20**, would have ring conductors attached thereto, and would be electrically connected to conductors **34** via leads **45** as has been previously described. Of course, the synthetic muscle would have to be connected to an adjacent source of mechanical energy such as a muscle when used as a bio implant. As discussed above, a computer or microprocessor **43** may be used to selectively apply voltage signals generated by the synthetic muscle to electrodes **22**, **24**, so as to prevent random actuation of the diaphragm **20**. Flexing of the synthetic muscle by the adjacent muscle would cause current pulses in the synthetic muscle ring conductors which in turn would send current pulses to leads **45** and electrodes **22**, **24**.

[**0043**] Of course, electrical pulses may be supplied directly to electrodes **22**, **24** from an alternating voltage source via leads **45**.

[**0044**] It is to be understood that the provided illustrative examples are by no means exhaustive of the many possible uses for our invention.

[**0045**] From the foregoing description, one skilled in the art can easily ascertain the essential characteristics of this invention and, without departing from the spirit and scope thereof, can make various changes and modifications of the invention to adapt it to various usages and conditions.

[**0046**] It is to be understood that the present invention is not limited to the sole embodiment described above, but encompasses any and all embodiments within the scope of the following claims:

What is claimed is:

1. A pump assembly comprising:

a main body having an anterior end, a posterior end, and an interior chamber;

an intake conduit, said intake conduit fluidly coupled to said anterior end and an outlet conduit fluidly coupled to said interior chamber;

a first valve means for selectively allowing fluid flow from said intake conduit to said interior chamber, a second valve means for selectively allowing fluid flow from said interior chamber into and through said drainage conduit;

fluid displacement means for causing fluid flow through said main body, said fluid displacement means having a flexible main body and extending across said interior chamber;

whereby oscillating movement of said fluid displacement means causes fluid flow through said pump assembly.

2. The assembly of claim 1 wherein said fluid displacement means includes at least one synthetic muscle.

3. The assembly of claim 2 wherein a synthetic muscle is employed to generate power for said fluid displacement means.

4. The assembly of claim 1 wherein said main body is elongated and substantially planar, and wherein one or more outer surfaces of said main body are contoured in accordance with physical parameters of an implant area..

5. The assembly of claim 1 wherein a predetermined quantity of medicine is stored in said interior chamber and wherein fluid flow through said interior chamber causes mixing of said medicine with the ambient fluid, a portion of said medicine dispensed through said drainage conduit with each cycle of operation of said fluid displacement means.

6. The assembly of claim 1 wherein said fluid displacement means is powered by a source of electrical power.

7. The assembly of claim 6 wherein ring electrodes are disposed on opposite sides of said fluid displacement means, said ring electrodes electrically connected to said source of electrical power.

8. The assembly of claim 6 wherein said source of electrical power is a mutually inducting coil.

9. A bio-implantable pump assembly comprising:

a substantially planar main body having an anterior end, a posterior end, and an interior chamber;

an intake conduit, said intake conduit fluidly coupled to said anterior end and an outlet conduit fluidly coupled to said interior chamber;

a first valve means for selectively allowing fluid flow from said intake conduit to said interior chamber, a second valve means for selectively allowing fluid flow from said interior chamber into and through said drainage conduit;